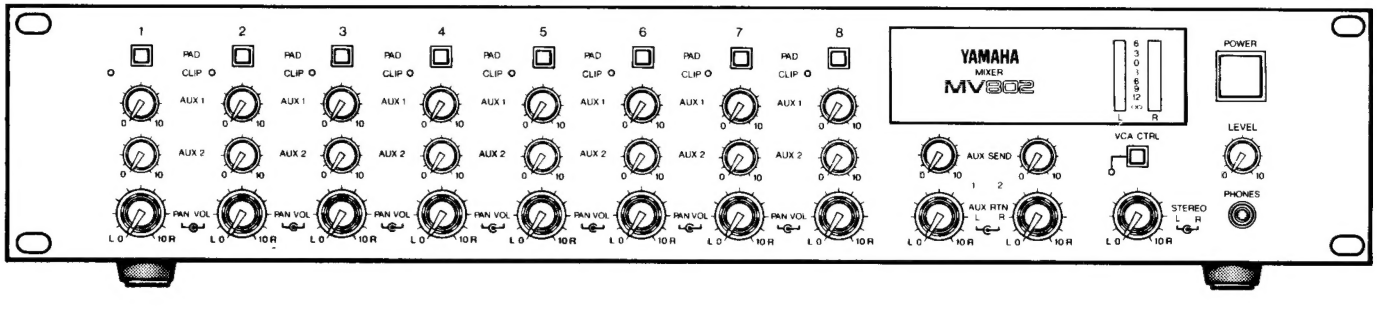
YAMAHA

Rack Mount Mixer

MV802

Operating Manual



CONGRATULATIONS!

You are the proud owner of a Yamaha MV802 Rack Mount Mixer. The MV802 is a versatile 19" rack-mountable mixer featuring:

* *8 line-level input channels with stereo panning controls.*
* *Microphone-level input capability on channels 1 and 2.*
* *Switchable input pads.*
* *Two auxiliary stereo returns.*
* *Master auxiliary send and return level controls.*
* *Stereo master program buss with independent L and R channel level controls.*
* *Balanced and unbalanced stereo outputs.*
* *LED stereo buss VU level meters.*
* *Cascade capability.*
* *VCA foot control of stereo output level with optional FC-7 foot controller.*
* *Sub in/out for all mix busses.*

Of course, the MV802 also offers the high standard of quality and great sound that Yamaha is famous for. We urge you to read this operation manual thoroughly in order to make the most of the MV802's many features and controls.

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PRECAUTIONS

1. **AVOID EXCESSIVE HEAT, HUMIDITY, DUST AND VIBRATION**
   Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity — such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation or vibration which could cause mechanical damage.

2. **AVOID PHYSICAL SHOCKS**
   Strong physical shocks to the unit can cause damage. Handle it with care.

3. **DO NOT OPEN THE CASE OR ATTEMPT REPAIRS OR MODIFICATIONS YOURSELF**
   This product contains no user-serviceable parts. Refer all maintenance to qualified Yamaha service personnel. Opening the case and/or tampering with the internal circuitry will void the warranty.

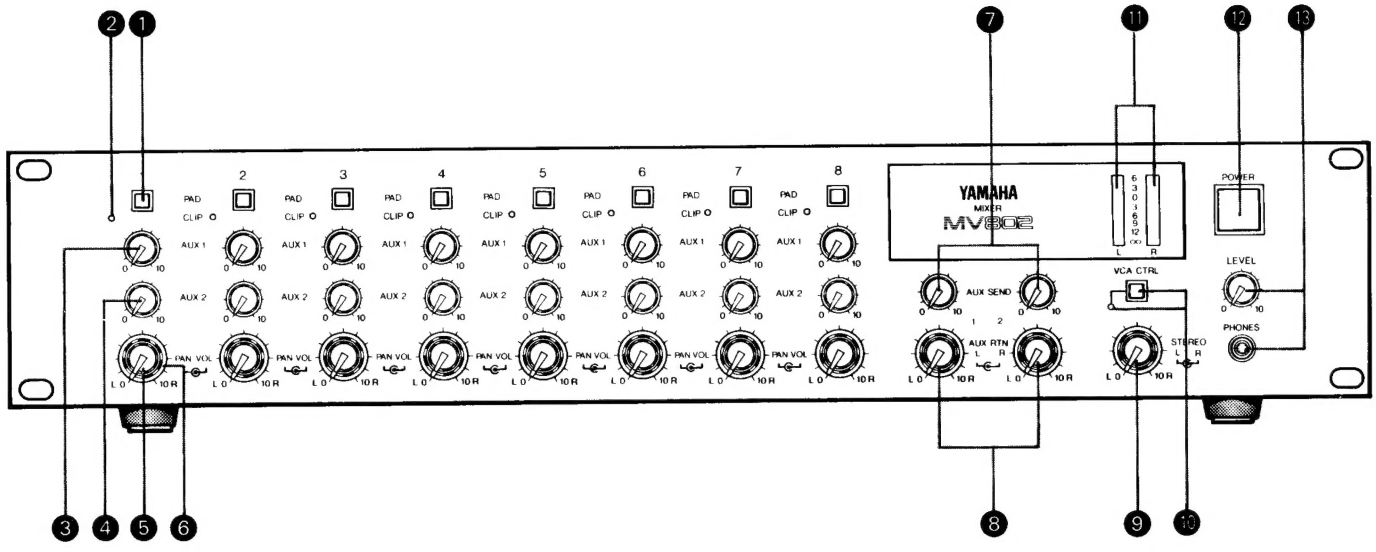
4. **MAKE SURE POWER IS OFF BEFORE MAKING OR REMOVING CONNECTIONS**
   Always turn the power OFF prior to connecting or disconnecting cables. This is important to prevent damage to the unit itself as well as other connected equipment.

5. **HANDLE CABLES CAREFULLY**
   Always plug and unplug cables — including the AC cord — by gripping the connector, not the cord.

6. **CLEAN WITH A SOFT DRY CLOTH**
   Never use solvents such as benzine or thinner to clean the unit. Wipe clean with a soft, dry cloth.

7. **ALWAYS USE THE CORRECT POWER SUPPLY**
   Make sure that the power supply voltage specified on the rear panel matches your local AC mains supply.

FRONT PANEL CONTROLS



Input Channels

❶ PAD switch

This switch attenuates the line-level signal applied to the corresponding rear-panel input by 20 dB, or 7 dB in the case of microphone-level input on channels 1 or 2 (see "⓯ LINE/MIC selector" on page 5). The PAD switch is useful to prevent overloading of the input circuitry when receiving high-level signals.

❷ CLIP indicator

The CLIP indicator LED lights when the signal applied to the corresponding channel's input reaches a level 3 dB below the clipping level of the mixer's input circuitry. If the CLIP indicator lights more than only briefly on high-level transients it is necessary to reduce the output level of the source connected to that channel's input, or use the PAD switch to attenuate the incoming signal level.

❸ AUX 1 control

The AUX 1 control determines the level of the signal sent from that channel to the master AUX SEND 1 control ❼ and rear-panel AUX SEND 1 jack ⓰. The AUX 1 controls can be used to determine the amount of signal from the corresponding channel sent to digital reverb, delay, or other effect devices fed by the AUX SEND 1 jack.

* AUX 1 is a pre-fader control, so the AUX 1 level is not affected by the setting of the channel LEVEL control.

❹ AUX 2 control

The AUX 2 control determines the level of the signal sent from that channel to the master AUX SEND 2 control ❼ and rear-panel AUX SEND 2 jack ⓰. The AUX 2 controls can be used to determine the amount of signal from the corresponding channel sent to digital reverb, delay, or other effect devices fed by the AUX SEND 2 jack.

* AUX 2 is a post-fader control, so the AUX 2 level is dependent on the setting of the channel LEVEL control.

❺ Channel LEVEL control

This is the main level control for each input channel. It determines the level of the signal sent from the corresponding input channel to the master stereo buss. The settings of the 8 input channel LEVEL controls determines the "mix" or balance of sound levels between the instruments or other sources connected to the inputs.

* If a channel is not being used, its LEVEL control should be set fully counterclockwise (0, OFF) to prevent unwanted noise from being added to the main program signal.

❻ PAN pots (controls)

The PAN pot determines the position in the stereo sound field at which the sound from that channel is heard. When the pan control is rotated fully counterclockwise, the channel signal will be delivered from the left output only, and will be heard at the far left of the stereo sound field. If the PAN pot is turned fully clockwise, the sound from that channel will appear at the far right of the stereo sound field. If the PAN pot is set at its center position, the channel signal will be sent equally to both the left and right channels, causing the sound to appear at the center of the sound field. Intermediate PAN pot settings cause the sound to be heard at the corresponding position.

Master Control Section

❼ AUX SEND 1 & AUX SEND 2 controls

These adjust the overall output level of the AUX 1 and AUX 2 "mixes" set up using the AUX 1 and AUX 2 controls on channels 1 through 8. AUX SEND 1 sets the overall level of the AUX 1 mix signal appearing at the AUX SEND 1 jack, and AUX SEND 2 sets the overall level of the AUX 2 mix signal appearing at the AUX SEND 2 jack. These controls should be used to optimally match the AUX SEND output level of the MV802 to the input sensitivity of the effect or signal processing device used.

❽ AUX RETURN 1 & AUX RETURN 2 controls

These controls adjust the level of the signal received at the rear-panel AUX RETURN jacks and mixed into the main stereo program. Since stereo aux returns are provided (AUX RETURN 1 L & R, AUX RETURN 2 L & R) both the AUX RETURN controls are dual-concentric types permitting independent control of the AUX RETURN levels sent to the left and right stereo buss. The rear ring controls the left-channel return level while the front knob controls the right-channel return level.

❾ STEREO master control

The STEREO master control is a dual-concentric type control which independently adjusts the level of the left and right channel main stereo buss signals appearing at the STEREO OUT terminals. The rear ring controls the overall level of the left-channel output while the front knob controls the overall output level of the right channel.

❿ VCA CONTROL switch and indicator

When this switch is ON (its indicator LED lights) an optional FC-7 Foot Controller can be used to control the overall level of the MV802 STEREO OUT signals.

⓫ Stereo level meter

Displays the VU level of the signals appearing at the left and right channel STEREO OUT terminals. The meter is a useful aid in setting optimum output levels using the STEREO master level controls.

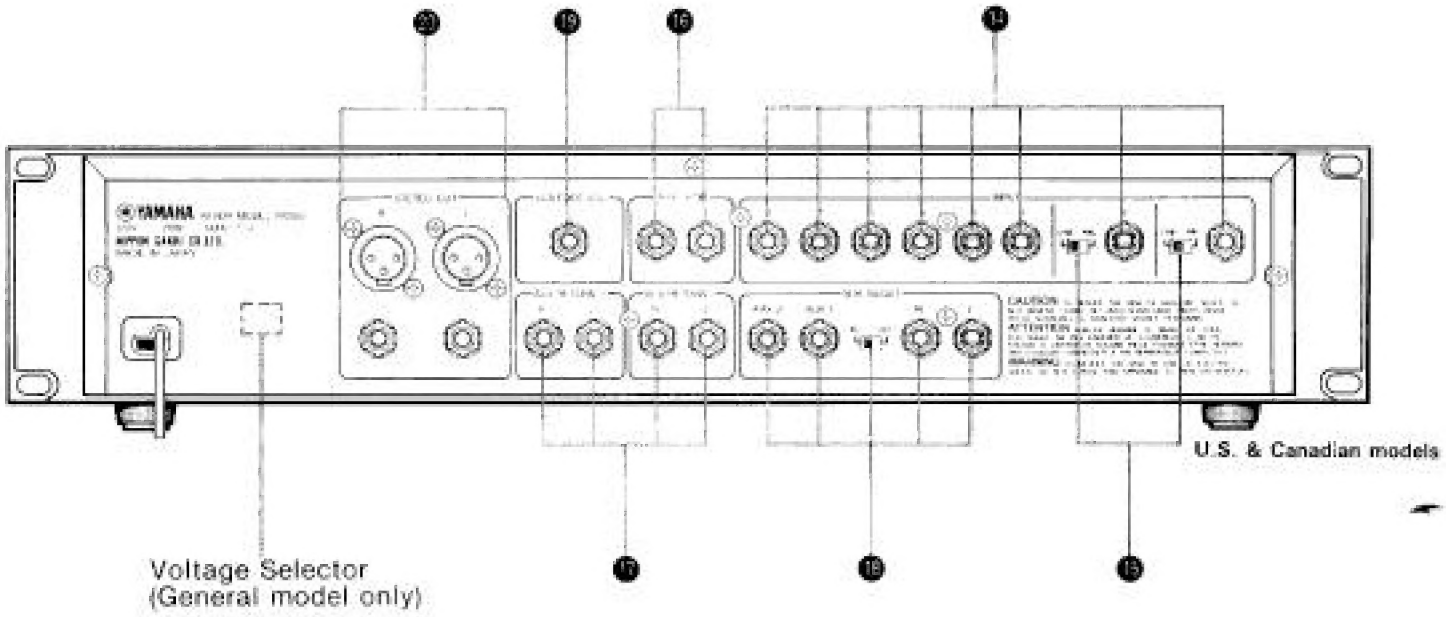
⓬ POWER switch

Press once to turn power ON, and a second time to turn power OFF. The " ∞ " LEDs of the stereo level meter will light when the power is ON.

⓭ PHONES controls and jack

The PHONES jack delivers the master stereo signals to a pair of 8 ohm stereo monitor headphones. The PHONES control adjusts the headphone monitoring level.

REAR PANEL CONNECTORS AND CONTROLS



⓫ INPUT jacks 1–8
These jacks accept input from electric and electronic instruments, or any other line-level source. Channels 1 and 2 can be switched for microphone-level input (see "⓭ LINE/MIC switch" below for details and a level chart)

⓬ LINE/MIC switch
LINE/MIC switches are provided for INPUTs 1 and 2 (located next to the corresponding INPUT jacks on the rear panel. When set to **LINE** the corresponding jack functions the same as INPUT jacks 3 through 8. When set to MIC, however, sensitivity is increased permitting microphone-level input. The following chart shows the input level ranges available through combinations of the LINE/MIC switch and front-panel PAD switch settings.

Channel	LINE/MIC	PAD	Nominal Input Level	Optimum Source Impedance
1 & 2	LINE	OFF	– 20 dB	600 ohms
		ON	0 dB	
	MIC	OFF	– 50 dB	150 – 600 ohms
		ON	– 43 dB	
3 – 8	–	OFF	– 20 dB	600 ohms
		ON	0 dB	

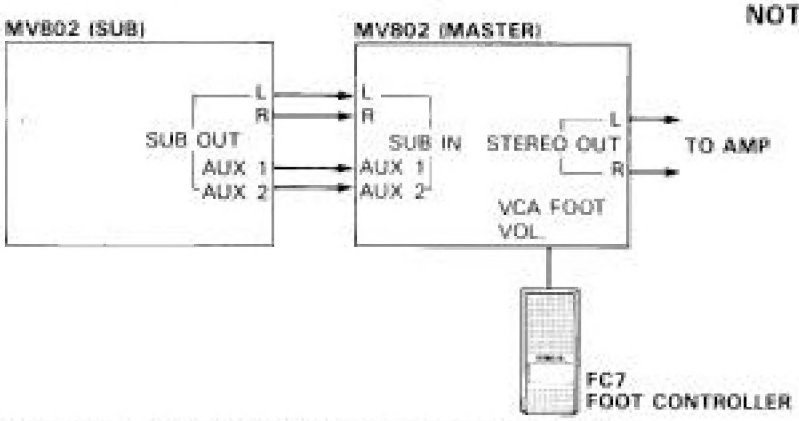
⓮ AUX SEND 1 & AUX SEND 2 jacks
These jacks deliver the AUX 1 and AUX 2 mixes, respectively, to feed an external digital delay, reverb, or other effect unit. Nominal output level/impedance is – 10 dB/10 k-ohms.

⓯ AUX RETURN 1 (L & R) & AUX RETURN 2 (L & R) jacks
The mono or stereo output from the effect units fed by the AUX OUT 1 and AUX OUT 2 jacks are returned to the main stereo program mix via these jacks. Note that each AUX RETURN offers independent return inputs for the left and right busses, accommodating the return signal from effect units featuring stereo outputs (the Yamaha SPX90 Multi-Effect Processor, for example). Nominal input level/impedance is – 20 dB/600 ohms.

⑬ SUB I/O (Inputs/Outputs) jacks & SUB IN/OUT switch

These four jacks and selector switch permit "cascading" two MV802's to increase the number of available input channels to 16. When two MV802's are cascaded, one functions as a sub-mixer and the second as a master mixer. The input channels on the sub-mixer operate normally but the master section controls are not used. The input channels of the master mixer also function normally, and its master section controls the entire system. That is, the STEREO master level control, AUX SEND and AUX RETURN controls of the master mixer function for all 16 input channels. VCA foot control applied to the master mixer also controls the overall output level of the entire program.

The SUB IN/OUT switch determines whether the SUB I/O jacks function as inputs or outputs, and thus whether the MV802 functions as sub-mixer or master mixer. For sub-mixer operation the SUB IN/OUT switch should be set to the "OUT" position, while for master mixer operation it should be set to the "IN" position. The diagram below shows the proper connections and switch settings.



Refer to the BLOCK DIAGRAM on page 8 for details on signal routing in cascaded operation.

NOTE: For normal single mixer operation the SUB IN/OUT switch should be set to the "IN" position. In this condition the L, R, AUX 1 and AUX 2 SUB jacks function as inputs, and can be used to add external line-level signals into the corresponding stereo master and AUX busses.

⑭ VCA CONTROL jack

This jack accepts control voltage input from an optional Yamaha **FC-7** Foot Controller. When the front-panel VCA CONTROL switch is ON, an **FC-7** connected to this jack can be used for foot control of the signal level appearing at the STEREO OUT jacks. This allows convenient foot control of the overall volume of a group of keyboards, tone generators or other instruments while playing or performing other operations.

⑮ STEREO OUT L & R jacks/connectors

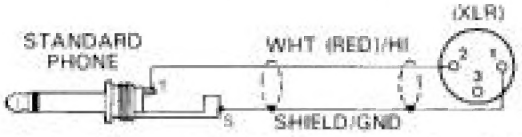
The MV802 provides both unbalanced phone jack and balanced XLR connector outputs from the main stereo buss. The signal delivered is a stereo mix of the input channel signals and the signals returned to the AUX RETURN jacks. The STEREO OUT signal will normally be used to drive a power amplifier and speaker system, powered keyboard speakers or a main house mixing console. Nominal output level/load impedance for the unbalanced phone jack outputs is +4 dB/10 k-ohms. Nominal output level/load impedance for the balanced XLR connectors is +4 dB/600 ohms. XLR and 1/4 inch phone plug outputs may be used simultaneously, for example; the 1/4 inch outputs would feed an on-stage amplifier/speaker system while the XLR outputs would send a stereo sub-mix to the house console.

NOTE: The MV802 XLR connectors are wired according to DIN specifications. Pin 1 is shield (ground), pin 2 is hot (signal high) and pin 3 is cold (signal low).

NOTE: Connection of sources with balanced outputs to the MV802.

The MV802 keyboard mixer has unbalanced inputs using 1/4 inch phone jack connectors while the TX816 FM tone module rack, for example, has balanced outputs and XLR type connectors. This apparent incompatibility can be easily and inexpensively overcome by using the audio cable described below to connect the TX816 output to the MV802 input. The method outlined is an accepted means of connecting balanced and unbalanced equipment and is commonly used by audio professionals. Use of this cable will unbalance the output of the TX816 and it is therefore best to keep your cable length under 20 feet.

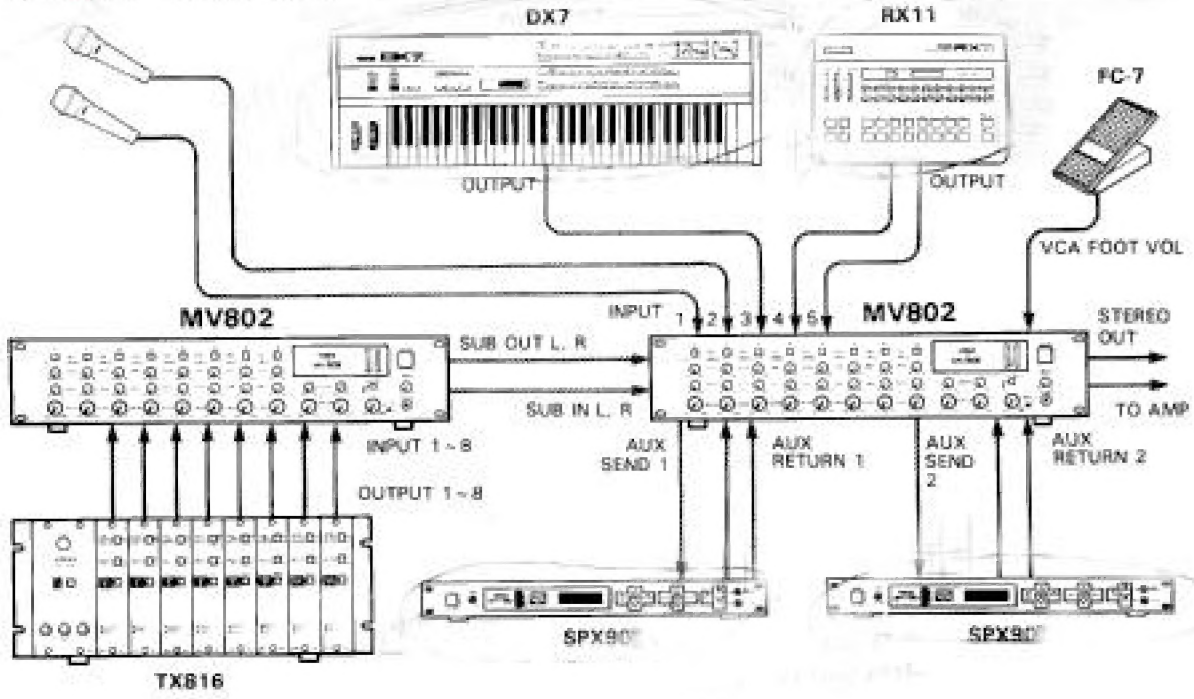
MATERIALS — 1/4 inch phone plug
Shielded, single conductor audio cable
Female XLR connector



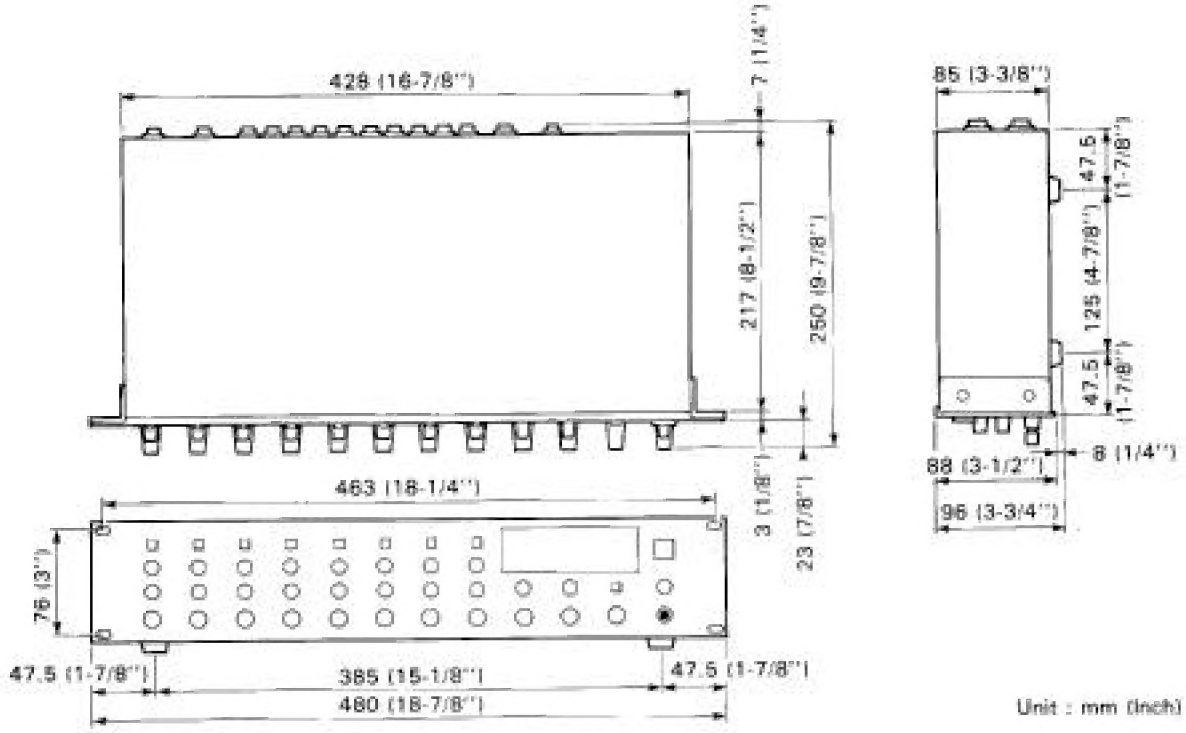
(Note: This cable is for use only with devices using differentially balanced outputs. If you wish to use it with devices having transformer balanced outputs it will be necessary to install a jumper wire between pins 1 and 3 of the XLR connector.)

SAMPLE CONNECTION DIAGRAM

Here's just one example of a possible keyboard player's system built around a pair of cascaded MV802 Rack Mount Mixers. Line-level sources include the 8 outputs from a Yamaha TX816 8-module FM Tone Generator system, a DX7 Digital Programmable Algorithm Synthesizer (which drives the TX816 via MIDI) and the stereo outputs from a RX11 Digital Rhythm Programmer. A pair of microphones are connected to inputs 1 and 2 on the master MV802 for vocals or announcements. An FC-7 foot controller is used for VCA volume control so the level of the entire system can be controlled by the performer while playing the DX7. The AUX 1 SEND/RETURN system is hooked up to an SPX90 Multi-effect Processor for reverberation, while the AUX 2 system is connected to a second SPX90 for other effects.

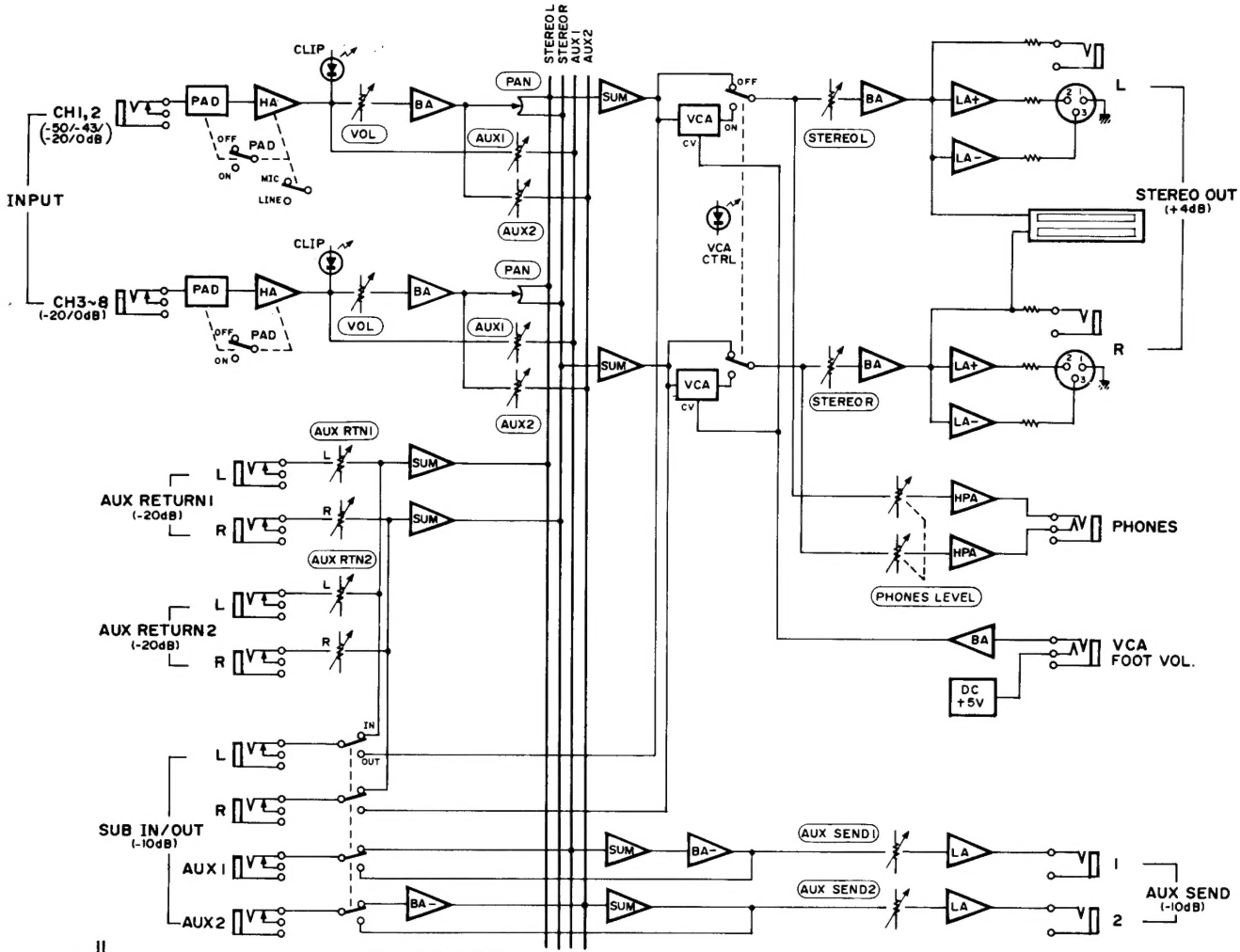


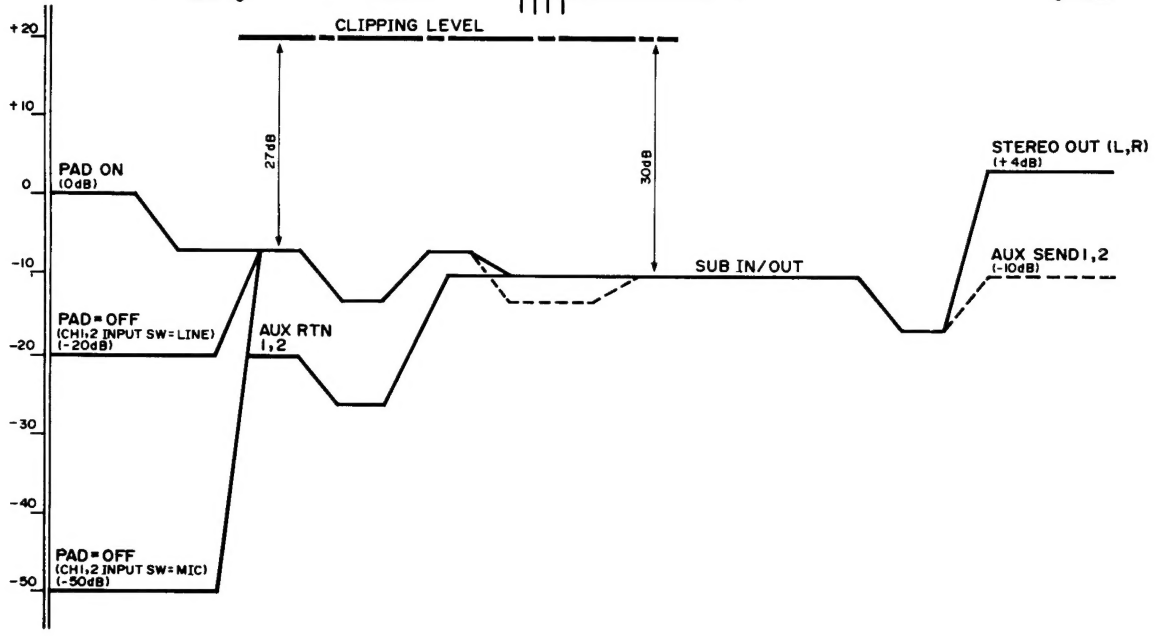
DIMENSIONS



Unit : mm (inch)

BLOCK & LEVEL DIAGRAM





SPECIFICATIONS

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Total Harmonic Distortion	Less than 0.1%, 20 Hz – 20 kHz @ +14 dB into 600 ohms.
Frequency Response	+1, –1.5 dB, 20 Hz – 20 kHz @ +4 dB into 600 ohms (STEREO OUT).
Maximum Output Level	+20 dB into 600 ohms @ 0.2% THD, 20 Hz – 20 kHz, STEREO OUT (balanced).
Hum and Noise (20 Hz – 20 kHz, Rs = 150 ohms, Input Pad @ OFF	–122 dB equivalent input noise. –90 dB residual output noise (STEREO OUT). –100 dB residual output noise (AUX SEND 1, 2). –68 dB (72 dB S/N) at STEREO OUT with master control and one channel level control at nominal level. –86 dB (76 dB S/N) at AUX SEND with master level control at nominal level and channel AUX level controls at minimum.
Maximum Voltage Gain	66 dB CH IN 1, 2 (MIC), to STEREO OUT. 36 dB CH IN 3–8 to STEREO OUT. 30 dB AUX RETURN to STEREO OUT. 20 dB SUB IN to STEREO OUT.
Crosstalk	–60 dB at 1 kHz, adjacent input channels. –60 dB at 1 kHz, input to output.
Meters (0 VU = +4 dB Output)	2 LED bar-graph meters, STEREO OUT L, R.
Power Requirements **U.S. & Canadian model** **General model**	 120V AC 60Hz 110-120/220-240V AC 50/60Hz
Power Consumption	20 watts.
Dimensions (W × H × D)	480 × 96 × 243 mm. (18-7/8" × 3-13/16" × 9-1/2")
Weight	4.1 kg (9.0 lbs)

INPUT SPECIFICATIONS

INPUT	MIC/ LINE	PAD	INPUT IMPEDANCE	SOURCE IMPEDANCE	SENSITIVITY (MAX. GAIN)	INPUT LEVEL		CONNECTOR
						RATED	MAX. NON-CLIP	
CH INPUT (CH 1, 2)	MIC	OFF	10Kohms	150 – 600ohm mics	–62dB(0.62mV)	–50dB(2.5mV)	–23dB(55mV)	Phone Jack
		ON			–55dB(1.4mV)	–43dB(5.5mV)	–16dB(123mV)	
	LINE	OFF		600ohm lines	–32dB(19mV)	–20dB(78mV)	+7dB(1.74V)	
		ON			–12dB(195mV)	0dB(775mV)	+20dB(7.75V)	
CH INPUT (CH 3 – 8)		OFF	10Kohms	600ohm lines	–32dB(19mV)	–20dB(78mV)	+7dB(1.74V)	Phone Jack
		ON			–12dB(195mV)	0dB(775mV)	+20dB(7.75V)	
AUX RETURN 1, 2			20Kohms	600ohm lines	–26dB(39mV)	–20dB(78mV)	+20dB(7.75V)	Phone Jack
SUB IN (L,R,AUX 1, 2)			68Kohms	600ohm lines	–16dB(123mV)	–10dB(245mV)	+20dB(7.75V)	Phone Jack

** Sensitivity is the lowest level that will produce an output of +4dB (1.23V), or the nominal output level when the unit is set to maximum gain.*

OUTPUT SPECIFICATIONS

OUTPUT	OUTPUT IMPEDANCE	LOAD IMPEDANCE	OUTPUT LEVEL		CONNECTOR
			RATED	MAX. NON-CLIP	
STEREO OUT	150ohms	600ohm lines	+4dB (1.23V)	+20dB (7.75V)	XLR-3-32 Type
	600ohms	10Kohm lines	+4dB (1.23V)	+20dB (7.75V)	Phone Jack
AUX SEND 1, 2	600ohms	10Kohm lines	–10dB (245mV)	+20dB (7.75V)	Phone Jack
SUB OUT (L,R,AUX 1,2)	600ohms	10Kohm lines	–10dB (245mV)	+20dB (7.75V)	Phone Jack
PHONES OUT	100ohms	8Ω Headphones	–22dB (62mV)	–4.5dB (461mV)	Stereo Phone Jack

- *0dB is referenced to 0.775V.*
- *XLR connectors are balanced. All Phone Jacks are unbalanced.*

All specifications subject to change without notice.

SERVICE

The MV802 is supported by Yamaha's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest Yamaha dealer.

YAMAHA

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